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CLAIMS

We claim:

- 1. A method of inhibiting ztnf4 activity in a mammal comprising administering to said mammal an amount of a compound selected from the group consisting of:
- a) a polypeptide comprising the extracellular domain of BR43x2;
- b) a polypeptide comprising the extracellular domain of TACI;
- c) a polypeptide comprising the extracellular domain of BCMA;
- d) a polypeptide comprising the sequence of SEQ ID NO:10;
- e) an antibody or antibody fragment which specifically binds to a polypeptide of SEQ ID NO:2;
- f) an antibody or antibody fragment which specifically binds to a polypeptide of SEQ ID NO:4;
- g) an antibody or antibody fragment which specifically binds to a polypeptide of SEQ ID NO:6;
- h) an antibody or antibody fragment which specifically binds to a polypeptide of SEQ ID NO:8;
- i) an antibody or antibody fragment which specifically binds to a polypeptide of SEQ ID NO:10;
 - k) a polypeptide of SEQ ID NO:4;
 - 1) amino acid residues 1-166 of SEQ ID NO:6; and
 - m) amino acid residues 1-150 of SEQ ID NO:8.
- 2. A method according to claim 1, wherein said compound is a fusion protein consisting of a first portion and a second portion joined by a peptide bond, said first portion comprising a polypeptide selected from the group consisting of:
- a) a polypeptide comprising the sequence of SEQ ID NO:8;
- b) a polypeptide comprising amino acid residues 25-58 of SEQ ID NO:2;

- c) a polypeptide comprising amino acid residues 34-66 of SEQ ID NO:6;
- d) a polypeptide comprising amino acid residues 71-104 of SEQ ID NO:6;
- e) a polypeptide comprising amino acid residues 25-104 of SEQ ID NO:6;
- f) a polypeptide comprising amino acid residues 8-37 of SEQ ID NO:8;
- g) a polypeptide comprising amino acid residues 41-88 of SEQ ID NO:8;
- h) a polypeptide comprising amino acid residues 8- 88 of SEQ ID NO:8; and

said second portion comprising another polypeptide.

- 3. A method according to claim 2, wherein said first portion further comprises a polypeptide selected from the group consisting of:
 - a) amino acid residues 59-120 of SEQ ID NO:2;
 - b) amino acid residues 105-166 of SEQ ID NO:6; and
 - c) amino acid residues 89-150 of SEQ ID NO:8.
- 4. A method according to claim 2, wherein said first portion is selected from the group consisting of:
- a) a polypeptide comprising the extracellular domain of BR43x2;
- b) a polypeptide comprising the extracellular domain of TACI; and
- c) a polypeptide comprising the extracellular domain of BCMA.
- 5. A method according to claim 2, wherein said first portion is selected from the group consisting of:
 - a) a polypeptide of SEQ ID NO:4;
 - b) amino acid residues 1-154 of SEQ ID NO:6; and
 - c) amino acid residues 1-48 of SEO ID NO:8.

- 6. A method according to claim 2, wherein said second portion is an immunoglobulin heavy chain constant region.
- 7. A method according to claim 1, wherein said antibody or antibody fragment is selected from the group consisting of:
 - a) polyclonal antibody;
 - b) murine monoclonal antibody;
 - c) humanized antibody derived from b); and
 - d) human monoclonal antibody.
- 8. A method according the claim 7, wherein said antibody fragment is selected from the group consisting of F(ab'), F(ab), Fab', Fab, Fv, scFv, and minimal recognition unit.
- 9. A method according to claim 1, wherein said mammal is a primate.
- 10. A method according to claim 1, wherein said ztnf4 activity is associated with B lymphocytes.
- 11. A method according to claim 1, wherein said ztnf4 activity is associated with activated B lymphocytes.
- 12. A method according to claim 1, wherein said ztnf4 activity is associated with resting B lymphocytes.
- 13. A method according to claim 1, wherein said ztnf4 activity is associated with antibody production.
- 14. A method according to claim 13, wherein said antibody production is associated with an autoimmune disease.

- 15. A method according the claim 14, wherein said autoimmune disease is systemic lupus erythomatosis, myasthenia gravis, multiple sclerosis, or rheumatoid arthritis.
- 16. A method according to claim 1, wherein said ztnf4 activity is associated with asthma, bronchitis or emphysema.
- 17. A method according to claim 1, wherein said ztnf4 activity is associated with end stage renal failure.
- 18. A method according to claim 1, wherein said ztnf4 activity is associated with renal disease.
- 19. A method according to claim 18, wherein said renal disease is glomerulonephritis, vasculitis, nephritis or pyelonephritis.
- 20. A method according to claim 1, wherein said is associated with renal neoplasms, multiple myelomas, lymphomas, light chain neuropathy or amyloidosis.
- 21. A method according to claim 1, wherein said ztnf4 activity is associated with effector T cells.
- 22. A method according to claim 21, wherein said ztnf4 activity is associated with moderating immune response.
- 23. A method according the claim 21, wherein said activity is associated with immunosuppression.
- 24. A method according to claim 21, wherein said immunosuppression is associated with graft rejection, graft verses host disease or inflammation.
- 25. A method according to claim 24, wherein said activity is associated with autoimmune disease.

- 26. A method according to claim 25, wherein said autoimmune disease is insulin dependent diabetes mellitus or Crohn's Disease.
- 27. A method according to claim 26, wherein said ztnf4 activity is associated with inflammation.
- 28. A method according to claim 27, wherein said inflammation is associated with joint pain, swelling, anemia, or septic shock.
- 29. A method for inhibiting BR43x2, TACI or BCMA receptor-ligand engagement comprising administering an amount of a compound selected from the group consisting of:
- a) a polypeptide comprising the extracellular domain of BR43x2;
- b) a polypeptide comprising the extracellular domain of TACI;
- c) a polypeptide comprising the extracellular domain of BCMA;
- d) a polypeptide comprising the sequence of SEQ ID NO:10;
- e) an antibody or antibody fragment which specifically binds to a polypeptide of SEQ ID NO:2;
- f) an antibody or antibody fragment which specifically binds to a polypeptide of SEQ ID NO:4;
- g) an antibody or antibody fragment which specifically binds to a polypeptide of SEQ ID NO:6;
- h) an antibody or antibody fragment which specifically binds to a polypeptide of SEQ ID NO:8;
- i) an antibody or antibody fragment which specifically binds to a polypeptide of SEQ ID NO:10;
- j) an antibody or antibody fragment which specifically binds to a polypeptide of SEQ ID NO:18;

- k) an antibody or antibody fragment which specifically binds to a polypeptide of SEQ ID NO:20;
 - k) a polypeptide of SEQ ID NO:4;
 - 1) amino acid residues 1-166 of SEQ ID NO:6; and
 - m) amino acid residues 1-150 of SEQ ID NO:8.
- 30. A method according to claim 29, wherein said compound is a fusion protein consisting of a first portion and a second portion joined by a peptide bond, said first portion comprising a polypeptide selected from the group consisting of:
- a) a polypeptide comprising the sequence of SEQ ID NO:8;
- b) a polypeptide comprising amino acid residues 25-58 of SEQ ID NO:2;
- c) a polypeptide comprising amino acid residues 34-66 of SEQ ID NO:6;
- d) a polypeptide comprising amino acid residues 71-104 of SEQ ID NO:6;
- e) a polypeptide comprising amino acid residues 25-104 of SEQ ID NO:6;
- f) a polypeptide comprising amino acid residues 837 of SEQ ID NO:8;
- g) a polypeptide comprising amino acid residues 41-88 of SEQ ID NO:8;
- h) a polypeptide comprising amino acid residues 8-88 of SEQ ID NO:8; and

said second portion comprising another polypeptide.

- 31. A method according to claim 30, wherein said first portion further comprises a polypeptide selected from the group consisting of:
 - a) amino acid residues 59-120 of SEQ ID NO:2;
 - b) amino acid residues 105-166 of SEQ ID NO:6; and
 - c) amino acid residues 89-150 of SEQ ID NO:8.

- 32. A method according to claim 30, wherein said first portion is selected from the group consisting of:
- a) a polypeptide comprising the extracellular domain of BR43x2;
- b) a polypeptide comprising the extracellular domain of TACI; and
- c) a polypeptide comprising the extracellular domain of BCMA.
- 33. A method according to claim 30, wherein said first portion is selected from the group consisting of:
 - a) a polypeptide of SEQ ID NO:4;
 - b) amino acid residues 1-154 of SEQ ID NO:6; and
 - c) amino acid residues 1-48 of SEQ ID NO:8.
- 34. A method according to claim 30, wherein said second portion is an immunoglobulin heavy chain constant region.
- 35. A method according to claim 29, wherein said antibody or antibody fragment is selected from the group consisting of:
 - a) polyclonal antibody;
 - b) murine monoclonal antibody;
 - c) humanized antibody derived from b); and
 - d) human monoclonal antibody.
- 36. A method according the claim 35, wherein said antibody fragment is selected from the group consisting of F(ab'), F(ab), Fab', Fab, Fv, scFv, and minimal recognition unit.
- 37. A method according to claim 29, wherein said BR43x2, TACI or BCMA receptor-ligand engagement is associated with B lymphocytes.

- 38. A method according to claim 29, wherein said BR43x2, TACI or BCMA receptor-ligand engagement is associated with activated B lymphocytes.
- 39. A method according to claim 29, wherein said BR43x2, TACI or BCMA receptor-ligand engagement is associated with resting B lymphocytes.
- 40. A method according to claim 29, wherein said BR43x2, TACI or BCMA receptor-ligand engagement is associated with antibody production.
- 41. A method according to claim 29, wherein said antibody production is associated with an autoimmune disease.
- 42. A method according the claim 41, wherein said autoimmune disease is systemic lupus erythomatosis, myasthenia gravis, multiple sclerosis, or rheumatoid arthritis.
- 43. A method according to claim 29, wherein said BR43x2, TACI or BCMA receptor-ligand engagement is associated with asthma, bronchitis or emphysema.
- 44. A method according to claim 29, wherein said BR43x2, TACI or BCMA receptor-ligand engagement is associated with end stage renal failure.
- 45. A method according to claim 29, wherein said BR43x2, TACI or BCMA receptor-ligand engagement is associated with renal disease.
- 46. A method according to claim 45, wherein said renal disease is glomerulonephritis, vasculitis, nephritis or pyrlonephritis.

- 47. A method according to claim 29, wherein said receptor-ligand engagement is associated with renal neoplasms, multiple mylelomas, lymphomas, light chain neuropathy or amyloidosis.
- 48. A method according to claim 29, wherein said BR43x2, TACI or BCMA receptor-ligand engagement is associated with effector T cells.
- 49. A method according to claim 48, wherein said BR43x2, TACI or BCMA receptor-ligand engagement is associated with regulation of immune response.
- 50. A method according the claim 49, wherein said receptor-ligand engagement is associated with immunosuppression.
- 51. A method according to claim 50, wherein said immunosuppression is associated with graft rejection, graft verses host disease or inflammation.
- 52. A method according to claim 50, wherein said receptor-ligand engagement is associated with autoimmune disease.
- 53. A method according to claim 52, wherein said autoimmune disease is insulin dependent diabetes mellitus or Crohn's Disease.
- 54. A method according to claim 50, wherein said BR43x2, TACI or BCMA receptor-ligand engagement is associated with inflammation.
- 55. A method according to claim 54, wherein said inflammation is associated with joint pain, swelling, anemia, or septic shock.

- 56. An isolated polynucleotide molecule encoding a polypeptide of SEQ ID NO:2.
- $\,$ 57. An isolated polynucleotide molecule of SEQ ID NO:1.
- 58. An expression vector comprising the following operably linked elements:
 - a transcription promoter;
 - a polynucleotide molecule according to claim 56; and
 - a transcription terminator.
- 59. An expression vector according to claim 58 further comprising a secretory receptor-ligand engagement sequence operably linked to said polynucleotide molecule.
- 60. A cultured cell into which has been introduced an expression vector according to claim 58, wherein said cultured cell expresses said polypeptide encoded by said polynucleotide segment.
- 61. A method of producing a polypeptide comprising: culturing a cell into which has been introduced an expression vector according to claim 58;

whereby said cell expresses said polypeptide encoded by said polynucleotide molecule; and

recovering said expressed polypeptide.

- $\,$ 62. An isolated polypeptide having the sequence of SEQ ID NO:2.
- 63. A polypeptide of claim 62, in combination with a pharmaceutically acceptable vehicle.